

### ABSTRACT

A system and method for predicting the forces generated in the tire contact patch from measurements of tire deformations, including separating the lateral force, the vertical force, and the circumferential torque using measurements of tire deformations. A system and method for using a trained neural network or bilinear equations to determine any combination or permutation of one or more of any of the following from tire sidewall deformation sensors, e.g., magnetic tire sidewall torsion measuring (SWT) sensors: the lateral force acting on the tire, the circumferential torque acting on the tire, the longitudinal force acting on the tire, the vertical force acting on the tire, and forces and/or torques having any one or more of the foregoing as components thereof.